

GUIDED PRACTICE

SEE EXAMPLE 1

Simplify.

p. 460

1. $2^2 \cdot 2^3$

2. $5^3 \cdot 5^3$

3. $n^6 \cdot n^2$

4. $x^2 \cdot x^{-3} \cdot x^4$

SEE EXAMPLE 2

5. **Science** If you traveled in space at a speed of 1000 miles per hour, how far would you travel in 7.5×10^5 hours? Write your answer in scientific notation.

p. 461

SEE EXAMPLE 3

Simplify.

p. 462

6. $(x^2)^5$

7. $(y^4)^8$

8. $(p^3)^3$

9. $(3^{-2})^2$

10. $(a^{-3})^4 \cdot (a^7)^2$

11. $xy \cdot (x^2)^3 \cdot (y^3)^4$

SEE EXAMPLE 4

Simplify.

p. 463

12. $(2t)^5$

13. $(6k)^2$

14. $(r^2s)^7$

15. $(-2x^5)^3$

16. $-(2x^5)^3$

17. $(a^2b^2)^5 \cdot (a^{-5})^2$

PRACTICE AND PROBLEM SOLVING

Independent Practice

For Exercises	See Example
18–21	1
22	2
23–28	3
29–34	4

Simplify.

18. $3^3 \cdot 2^3 \cdot 3$

19. $6 \cdot 6^2 \cdot 6^3 \cdot 6^2$

20. $a^5 \cdot a^0 \cdot a^{-5}$

21. $x^7 \cdot x^{-6} \cdot y^{-3}$

22. **Geography** Rhode Island is the smallest state in the United States. Its land area is about 2.9×10^{10} square feet. Alaska, the largest state, is about 5.5×10^2 times as large as Rhode Island. What is the land area of Alaska in square feet? Write your answer in scientific notation.

Extra Practice

Skills Practice p. S16
 Application Practice p. S34

Simplify.

23. $(2^3)^3$

24. $(3^6)^0$

25. $(x^2)^{-1}$

26. $(b^4)^5 \cdot b$

27. $b \cdot (a^3)^4 \cdot (b^{-2})^3$

28. $(x^4)^2 \cdot (x^{-1})^{-4}$

29. $(3x)^3$

30. $(5w^8)^2$

31. $(p^4q^2)^7$

32. $(-4x^3)^4$

33. $-(4x^3)^4$

34. $(x^3y^4)^3 \cdot (xy^3)^{-2}$

Find the missing exponent in each expression.

35. $a^{\square} a^4 = a^{10}$

36. $(a^{\square})^4 = a^{12}$

37. $(a^2b^{\square})^4 = a^8b^{12}$

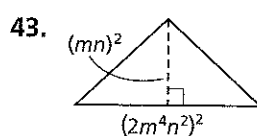
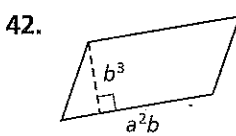
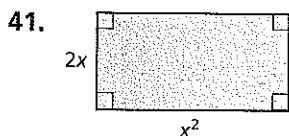
38. $(a^3b^6)^{\square} = \frac{1}{a^9b^{18}}$

39. $(b^2)^{-4} = \frac{1}{b^{\square}}$

40. $a^{\square} \cdot a^6 = a^6$



Geometry Write an expression for the area of each figure.



Simplify, if possible.

44. x^6y^5

45. $(2x^2)^2 \cdot (3x^3)^3$

46. $x^2 \cdot y^{-3} \cdot x^{-2} \cdot y^{-3}$

47. $(5x^2)(5x^2)^2$

48. $-(x^2)^4(-x^2)^4$

49. $a^3 \cdot a^0 \cdot 3a^3$

50. $(ab)^3(ab)^{-2}$

51. $10^2 \cdot 10^{-4} \cdot 10^5$

52. $(x^2y^2)^2(x^2y)^{-2}$